REMARKS

Reconsideration and withdrawal of the rejections set forth in the Office Action dated April 8, 2008, is respectfully requested in view of this amendment. By this amendment, the specification has been amended and claims 1, 2, 12 and 13 have been amended. Claims 1-13 are pending in this application.

The amendment to the specification substitutes the substance of claim 1 for "According to the present invention there is provided a method according to claim 1."

The amendments to claims 1 and 2 set forth the comparing of real-time stamps and remote media card clock time-stamps. Support is found in the specification, *inter alia*, in the abstract and in paragraphs [0029] - [0031]. Claims 12 and 13 are written into independent form, with inclusion of subject matter related to the time stamps as set forth in claim 1.

It is respectfully submitted that the above amendments introduce no new matter within the meaning of 35 U.S.C. §132.

In the outstanding Office Action, the Examiner rejected claims 12 and 13 under 35 U.S.C. §101 as directed to non-statutory subject matter. Claims 1-5 and 8-13 were rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent Application Publication No. 2004/0090994 (Lockridge et al.), hereinafter "*Lockridge*". Claim 6 was rejected under 35 U.S.C. §103(a) as unpatentable over *Lockridge*, in view of U.S. Patent No. 6,327,274 (Ravikanth), hereinafter "*Ravikanth*". Claim 7 was rejected under 35 U.S.C. §103(a) as unpatentable over *Lockridge*, in view of U.S. Patent No. 6,643,496 (Shimoyama et al.), hereinafter "*Shimoyama*". These rejections, as applied to the revised claims, are respectfully traversed.

Rejections under 35 USC §101

In the Office Action, claims 12 and 13 were rejected under 35 U.S.C. §101 because the invention is directed to non-statutory subject matter.

Response

The claims, as now presented, are believed to embody statutory subject matter. In particular, the claims now set forth the subject matter as a particular device (claim 12), or as computer program code stored on a storage medium which when executed in a telephony local device is arranged to determine clock skew in a packet-based session. Accordingly, both claims now describe functional changes or structures as required under 35 U.S.C. § 101.

Rejections Under 35 U.S.C. §102

Claims 1-5 and 8-13 were rejected under 35 U.S.C. §102(b) as anticipated by *Lockridge*. *Lockridge* was cited as showing determination of clock skew in a packet-based session, in which control packets included time stamps, with a determination of a first relative rate and which describes a client's system clock that uses the time stamps to track the server's system clock. Thus *Lockridge* describes clock rates relative to skew detection.

Response

This rejection is traversed as follows. For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP §2131. The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP §2131.

Applicants' independent claim 1 describes:

> "... comparing a first real-time stamp and a first remote media card clock time-stamp from a first received control packet with second real-time stamp and a second remote media card clock time-stamp from a second received control packet to determine ... a first relative rate of a remote media card clock to the remote real time rate."

These features are neither shown nor suggested by *Lockridge*. To summarize the disclosure of *Lockridge* with respect to the present application:

- When packets leave the server en route to client, they are timestamped (T2) using the server clock.
- When these packets arrive at the client, they are timestamped (T3) using the client clock.

Although paragraph [0030] of *Lockridge* does not explicitly say so, it appears that *Lockridge* uses successive timestamps from packets n and n+1 to determine skew i.e. T2 and T3 from packet n and T2' and T3' from packet n+1 where skew = (T3'-T3) / (T2'-T2).

This approach works in *Lockridge* due to the deterministic nature of packet delay in the underlying network; i.e., *Lockridge* assumes that propagation delays between server and client are constant – see paragraph [0029] "Since the propagation delay from the server to the client is fixed and constant". This allows the client clock to lock onto the server clock using a comparison of T2 and T3 from given packets, and to compensate for skew in a manner similar to the locking of server and headend clock -- using a VXCO.

While it may not be as clear as it should from the use of the term timestamp in *Lockridge*, for the avoidance of doubt, Applicants would point out that each of T2, T2' and T3,T3' involve the same type of (32 bit) clock counter value. There is no indication that the *Lockridge* technique involves a "real-time stamp" as set forth in Applicants' claims 1 and 2, for example. A further example is the NTP stamp, as claimed in claim 6. It is pointed out that this real-time stamp is

distinct from "a media card clock time-stamp" (Applicants' claim 1) which comprises a counter value at the real-time in question. There is not evident in *Lockridge*.

While it may be true that the packets of *Lockridge* might include a real-time stamp for other protocol reasons, this is not discussed in *Lockridge*. Therefore, under 35 U.S.C. §102, it should be absolutely clear from the disclosure of *Lockridge* that such information is not used in determining "the relative rate of a remote media card clock to the remote real time rate" as set forth in the amended comparing step of claim 1. *Lockridge* fails to show that feature.

Claim 1 has been clarified to positively recite that the information from respective packets. In terms of *Lockridge*, Applicant's information from respective packets used in the calculation of the relative rate would comprise T2 and T2'. In this sense, Applicant uses this information as an alternative to *Lockridge*'s use of T3 and T3', by using remote real-time stamps for packet n and packet n+1. This of course contradicts *Lockridge*'s approach.

It will be seen that Claim 1, as amended, clearly sets forth the context of the present subject matter by reciting that the session is between a local device and a remote device with a non-deterministic packet delay.

Thus, the present subject matter as presented in the amended claims enables the extent of skew between media clocks where the intermediate network is non-deterministic to be determined and for play-out (rather than a clock rate) to be adjusted accordingly. Clearly, this approach is not disclosed or contemplated by *Lockridge* nor is *Lockridge* suitable for solving this problem.

Unlike *Lockridge*, implementations of the subject matter, as presently claimed, can also be used to make corrections to delay measurements in a jittery or noisy network and this can be very useful for optimizing the quality of time-sensitive applications such as VoIP – see claim 9.

Again, because in *Lockridge*, the propagation delay is constant, once a packet successfully leaves the interface at the sender as there are no intermediate nodes between sender

and receiver i.e. in a broadcast link, there may be collisions requiring retransmissions but ultimately, the timestamp T2 relates to when it is successfully sent.

With *Lockridge*, the actual delay is not a concern, and so *Lockridge* addresses timing (frequency) issues, as opposed to the present subject matter which uses synchronised time (of day), for example, via NTP, see claim 6, to resolve timing (frequency) differences; and in so doing, has the added benefit of providing precise real-time delay information in an environment where delay can change significantly.

Accordingly, it is submitted that *Lockridge* fails to show or suggest each and every feature of the subject matter as set forth in claims 1, 12 and 13.

We would also remark that claim 2 is dependent on claim 1 and that this requires a calculation of a second relative rate at the local device which is receiving packets, based on the relative timing of the packets it is transmitting. The only device in *Lockridge* which is both transmitting and receiving packets is the head-end server and it will be seen that this neither performs the steps of claim 1 nor the steps of claim 1 in combination with claim 2.

Rejections Under 35 U.S.C. §103

The Examiner rejected claim 6 under 35 U.S.C. 103(a) over *Lockridge*, in view of *Ravikanth*. Claim 7 was rejected under 35 U.S.C. §103(a) as unpatentable over *Lockridge*, in view of *Shimoyama*. These rejections, as applied to the amended claims, are respectfully traversed.

Response

This rejection is traversed as follows. To establish a *prima facie* case of obviousness, the Examiner must establish: (1) some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) the prior art references teach or suggest all of the claim limitations. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine,* 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

A *prima facie* case of obviousness must also include a showing of the reasons why it would be obvious to modify the references to produce the present subject matter. *See Dystar Textilfarben GMBH v, C. H. Patrick*, 464 F.3d 1356 (Fed. Cir. 2006). The Examiner bears the initial burden to provide some convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings. *Id.* at 1366.

It is noted that *Ravikanth* is not relevant to the novelty of claim 1; however, it appears to have been cited because it mentions NTP.

Examiner will appreciate that simply because a document mentions NTP, it will not mean that it could be combined with *Lockridge* to arrive at the combination of features of claim 6 or indeed even the features of claim 1.

Nonetheless, for completeness, *Ravikanth* can be summarized as follows:

- When packets are sent by the sender, a timestamp Ts is added to the packet.
- When a packet is received by the receiver, it is also timestamped Tr. Note: It makes no assumption about synchronised time between sender and receiver.
- At the receiver, this allows them to determine a one-way delay D = Tr-Ts which of course is subject to all kinds of errors as the clocks are not synchronised. From this, 2 variables are calculated, jitter J (which is the difference

in D between packet N and N+1), and interpacket send time IPT (which is the difference in send time Ts between packet N and N+1).

- Once a multitude of packets have been sent, skew is determine as the average of J divided by average of IPT i.e. relative skew = Avg(J)/Avg(IPT)
- IPT is constant for many multimedia applications.

As such, Applicants submit that *Ravikanth* is no more relevant than the prior art mentioned in the introduction to the present specification because *Ravikanth* is based on looking at *trends over time*. As such, *Ravikanth* presumes that network non-determinism will be filtered out, and that the more data it has, the better the result it gives. This can mean that sometimes a trend in network delay can be misinterpreted as skew. By contrast, the present subject matter is not in any way affected by network noise and will resolve skew regardless of variations in network latency.

Also, it will be seen that as Applicants' technique requires only a few packets to be received in order to determine skew, it can be implemented quickly and with little overhead as required for real-time applications such as VoIP which do not have the luxury of post processing a large amount of data. In a noisy network, *Ravikanth*'s approach will likely often fail unless it has a lot of data to work with.

In relation to any potential combination of *Lockridge* and *Ravikanth*, it will be seen that the skilled person with *Ravikanth* would simply use lots (n) of *Lockridge* packets containing $T2^1$, $T3^1$… $T2^n$, $T3^n$ to smooth out the problems of jitter in their network. Alternatively the skilled person with *Lockridge* would know that the approach of *Ravikanth* would provide little benefit as it aims to solve a problem that does not exist in the broadcast network of *Lockridge*.

Regarding claim 7, *Shimoyama* fails to suggest Applicants' features. It is respectfully pointed out that the simple mention of RTCP protocol in this document does not necessarily mean that a combination of *Lockridge* and *Shimoyama* would have the skilled person arrive at the features of claim 7.

Shimoyama discloses adjusting transmission rates between a server and client based on feedback received in both directions using the existing RTCP protocol. It basically uses RTCP RR (Receiver reports) as the RFC outlines, but *Shimoyama* is directed towards showing how such feedback might be used to optimize data rates -- including rate of RTCP packets -- while minimizing loss/delay. This has ***nothing to do with calculating skew.*** In fact, *Shimoyama* does not use SR in any way – only Receiver Reports (RR). Such Receiver Reports (RR) also have timestamps but for different reasons (enable the Round Trip Delay to be determined). Applicant therefore submits that the claims as amended are both novel and inventive vis-à-vis the cited references, taken alone or in combination. It is therefore respectively submitted that the rejection under 35 U.S.C. 103(a) should be withdrawn.

CONCLUSION

In light of the foregoing, Applicants submit that the application is in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner call the undersigned.

Respectfully submitted,
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